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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/667,081	Applicant(s) KO, KUNG-LING	
	Examiner VAIBHAV (MANU) SAWHNEY	Art Unit 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-5, 7-11, 13-17, 19-24, 43-54 are rejected under 35 U.S.C. 102(e) as being unpatentable by Oberman et al. (2003/0026267).

As to claim 1, Oberman et al. show a device wherein a port is configured to receive frames on a plurality of virtual channels (Page 2, paragraph 0018) comprising a network switch that implement credit-based flow control for Gigabit Ethernet packets and SoIP packets on virtual channels over inter-switch Gigabit Ethernet links. Further, the switch (device) supporting egress (outgoing) packet flows (that is comprised of frames) (on outgoing ports/transmitting) and ingress (incoming) packet flows (on incoming ports/receiving) on one or more virtual channels of the network switch (Page 2, paragraph 0018). Oberman et al. further show that incoming packets (frames) may be assigned to one of the active virtual channels by the transmitting port, or the packets may be assigned to a threshold group and have a flow number assigned to them by the

Network Processor of the receiving port, depending on the type of packet (Page 2, paragraph 0022). Also, the switch fabric may comprise a plurality of switch fabric portions 140 each having one input port and one output port and the switch fabric may include one or more input blocks 400, wherein each input block 400 is configured to receive internal format packet data (also referred to as frames) (Page 4, paragraph 0064). Further, a network switch may support K virtual channels per port, where K is a positive integer. In one embodiment, K=8. In mode 2, a port may be configured as a Gigabit Ethernet port supporting virtual channels (Page 9, paragraph 0106).

Oberman et al. further show a device wherein control logic is configured to determine the virtual channels associated with said frames based upon virtual channel characteristics from an external device (Page 2, paragraph 0022) comprising network switches comprising a GEMAC (Gigabit Ethernet Media Access Control), which is logic (control logic) that is configurable to couple a port of the network switch to a Gigabit Ethernet. The GEMAC and port in combination may be referred to as a Gigabit Ethernet port. Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may try and establish if a corresponding port on a second network switch (transmitter) is virtual channel capable. In one embodiment, this may be performed by the management CPU of the receiver network switch by first setting up the port as a standard Gigabit Ethernet port (with or without flow control). Then, a number of virtual channel parameters (virtual channel characteristics) may be set in configuration registers, and the GEMAC (Gigabit Ethernet Media Access Control) may be enabled for the port to try and establish contact with the switch on the other end for

virtual channel-based packet flow. This is done by sending a login frame to the transmitter port. Further, when establishing virtual channels on a link between network switches, the network switches may first go through a login procedure to determine if virtual channels may be established (Page 2, paragraph 0022). Further, network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel characteristics). These calculations may be based on the information the first network switch sent out in the login message (frames) and the information the first network switch received from the second network switch (external device) in the second switch's login message. In these calculations, the network switch determines the number of virtual channels it has to support for the other switch (IgVC) and the corresponding size of the packets (frames) it will receive from the other switch for each virtual channel (IgPktSz). IgPktSz represents the generic value for the packet size for a particular virtual channel. In these calculations, the switch also determines the number of virtual channels (virtual channel characteristics) that the other switch will support for it (EgVC) and the corresponding size of the packets that it can send to the other switch (EgPktSz) (Page 16, paragraph 0193).

As to claim 2, Oberman et al. show a device wherein said external device comprises a networking device comprising a switch (100B) (Fig. 17). Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may

try and establish if a corresponding port on a second network switch (external device) (transmitter) is virtual channel capable (Page 2, paragraph 0022).

As to claim 3, Oberman et al. show a device wherein said external device comprises a user terminal comprising the host/server (with Fibre Channel adapter cards) in the network as well (Page 1, paragraph 0006).

As to claim 4, Oberman et al. show a device wherein said characteristic comprises a set of virtual channel identifiers comprising network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel characteristics), thus obtaining various virtual channel identifiers along with the number of virtual channels (Fig. 25).

As to claim 5, Oberman et al. show a device wherein said characteristics comprise a virtual channel mapping mode comprising various modes including gigabit Ethernet port with virtual channel packet mode (Fig. 14).

As to claim 7, Oberman et al. show a device wherein a port is configured to transmit frames on a plurality of virtual channels (Page 2, paragraph 0018) comprising a network switch that implement credit-based flow control for Gigabit Ethernet packets and SoIP packets on virtual channels over inter-switch Gigabit Ethernet links. Further,

the switch (device) supporting egress (outgoing) packet flows (that is comprised of frames) (on outgoing ports/transmitting) and ingress (incoming) packet flows (on incoming ports/receiving) on one or more virtual channels of the network switch (Page 2, paragraph 0018). Oberman et al. further show that incoming packets (frames) may be assigned to one of the active virtual channels by the transmitting port, or the packets may be assigned to a threshold group and have a flow number assigned to them by the Network Processor of the receiving port, depending on the type of packet (Page 2, paragraph 0022). Also, the switch fabric may comprise a plurality of switch fabric portions 140 each having one input port and one output port and the switch fabric may include one or more input blocks 400, wherein each input block 400 is configured to receive internal format packet data (also referred to as frames) (Page 4, paragraph 0064). Further, a network switch may support K virtual channels per port, where K is a positive integer. In one embodiment, K=8. In mode 2, a port may be configured as a Gigabit Ethernet port supporting virtual channels (Page 9, paragraph 0106).

Oberman et al. further show a device wherein control logic is configured to determine the virtual channels associated with said frames based upon virtual channel characteristics from an external device (Page 2, paragraph 0022) comprising network switches comprising a GEMAC (Gigabit Ethernet Media Access Control), which is logic (control logic) that is configurable to couple a port of the network switch to a Gigabit Ethernet. The GEMAC and port in combination may be referred to as a Gigabit Ethernet port. Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may try and establish if a corresponding port on a second

network switch (transmitter) is virtual channel capable. In one embodiment, this may be performed by the management CPU of the receiver network switch by first setting up the port as a standard Gigabit Ethernet port (with or without flow control). Then, a number of virtual channel parameters (virtual channel characteristics) may be set in configuration registers, and the GEMAC (Gigabit Ethernet Media Access Control) may be enabled for the port to try and establish contact with the switch on the other end for virtual channel-based packet flow. This is done by sending a login frame to the transmitter port. Further, when establishing virtual channels on a link between network switches, the network switches may first go through a login procedure to determine if virtual channels may be established (Page 2, paragraph 0022). Further, network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel characteristics). These calculations may be based on the information the first network switch sent out in the login message (frames) and the information the first network switch received from the second network switch (external device) in the second switch's login message. In these calculations, the network switch determines the number of virtual channels it has to support for the other switch (IgVC) and the corresponding size of the packets (frames) it will receive from the other switch for each virtual channel (IgPktSz). IgPktSz represents the generic value for the packet size for a particular virtual channel. In these calculations, the switch also determines the number of virtual channels (virtual channel characteristics) that the other switch will support for it

(EgVC) and the corresponding size of the packets that it can send to the other switch (EgPktSz) (Page 16, paragraph 0193).

As to claim 8, Oberman et al. show a device wherein said external device comprises a networking device comprising a switch (100B) (Fig. 17). Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may try and establish if a corresponding port on a second network switch (external device) (transmitter) is virtual channel capable (Page 2, paragraph 0022).

As to claim 9, Oberman et al. show a device wherein said external device comprises a user terminal comprising the host/server (with Fibre Channel adapter cards) in the network as well (Page 1, paragraph 0006).

As to claim 10, Oberman et al. show a device wherein said characteristic comprises a set of virtual channel identifiers comprising network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel characteristics), thus obtaining various virtual channel identifiers along with the number of virtual channels (Fig. 25).

As to claim 11, Oberman et al. show a device wherein said characteristics comprise a virtual channel mapping mode comprising various modes including gigabit Ethernet port with virtual channel packet mode (Fig. 14).

As to claim 13, Oberman et al. show a device wherein a port is configured to receive and transmit frames on a plurality of virtual channels (Page 2, paragraph 0018) comprising a network switch that implement credit-based flow control for Gigabit Ethernet packets and SoIP packets on virtual channels over inter-switch Gigabit Ethernet links. Further, the switch (device) supporting egress (outgoing) packet flows (that is comprised of frames) (on outgoing ports/transmitting) and ingress (incoming) packet flows (on incoming ports/receiving) on one or more virtual channels of the network switch (Page 2, paragraph 0018). Oberman et al. further show that incoming packets (frames) may be assigned to one of the active virtual channels by the transmitting port, or the packets may be assigned to a threshold group and have a flow number assigned to them by the Network Processor of the receiving port, depending on the type of packet (Page 2, paragraph 0022). Also, the switch fabric may comprise a plurality of switch fabric portions 140 each having one input port and one output port and the switch fabric may include one or more input blocks 400, wherein each input block 400 is configured to receive internal format packet data (also referred to as frames) (Page 4, paragraph 0064). Further, a network switch may support K virtual channels per port, where K is a positive integer. In one embodiment, K=8. In mode 2, a

port may be configured as a Gigabit Ethernet port supporting virtual channels (Page 9, paragraph 0106).

Oberman et al. further show a device wherein control logic is configured to determine the virtual channels associated with said frames based upon virtual channel characteristics from an external device (Page 2, paragraph 0022) comprising network switches comprising a GEMAC (Gigabit Ethernet Media Access Control), which is logic (control logic) that is configurable to couple a port of the network switch to a Gigabit Ethernet. The GEMAC and port in combination may be referred to as a Gigabit Ethernet port. Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may try and establish if a corresponding port on a second network switch (transmitter) is virtual channel capable. In one embodiment, this may be performed by the management CPU of the receiver network switch by first setting up the port as a standard Gigabit Ethernet port (with or without flow control). Then, a number of virtual channel parameters (virtual channel characteristics) may be set in configuration registers, and the GEMAC (Gigabit Ethernet Media Access Control) may be enabled for the port to try and establish contact with the switch on the other end for virtual channel-based packet flow. This is done by sending a login frame to the transmitter port. Further, when establishing virtual channels on a link between network switches, the network switches may first go through a login procedure to determine if virtual channels may be established (Page 2, paragraph 0022). Further, network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels

(virtual channel characteristics). These calculations may be based on the information the first network switch sent out in the login message (frames) and the information the first network switch received from the second network switch (external device) in the second switch's login message. In these calculations, the network switch determines the number of virtual channels it has to support for the other switch (IgVC) and the corresponding size of the packets (frames) it will receive from the other switch for each virtual channel (IgPktSz). IgPktSz represents the generic value for the packet size for a particular virtual channel. In these calculations, the switch also determines the number of virtual channels (virtual channel characteristics) that the other switch will support for it (EgVC) and the corresponding size of the packets that it can send to the other switch (EgPktSz) (Page 16, paragraph 0193).

As to claim 14, Oberman et al. show a device wherein said external device comprises a networking device comprising a switch (100B) (Fig. 17). Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may try and establish if a corresponding port on a second network switch (external device) (transmitter) is virtual channel capable (Page 2, paragraph 0022).

As to claim 15, Oberman et al. show a device wherein said external device comprises a user terminal comprising the host/server (with Fibre Channel adapter cards) in the network as well (Page 1, paragraph 0006).

As to claim 16, Oberman et al. show a device wherein said characteristic comprises a set of virtual channel identifiers comprising network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel characteristics), thus obtaining various virtual channel identifiers along with the number of virtual channels (Fig. 25).

As to claim 17, Oberman et al. show a device wherein said characteristics comprise a virtual channel mapping mode comprising various modes including gigabit Ethernet port with virtual channel packet mode (Fig. 14).

As to claim 19, Oberman et al. show a switch wherein a port is configured to receive and send frames on a plurality of virtual channels (Page 2, paragraph 0018) comprising a network switch that implement credit-based flow control for Gigabit Ethernet packets and SoIP packets on virtual channels over inter-switch Gigabit Ethernet links. Further, the switch (device) supporting egress (outgoing) packet flows (that is comprised of frames) (on outgoing ports/transmitting) and ingress (incoming) packet flows (on incoming ports/receiving) on one or more virtual channels of the network switch (Page 2, paragraph 0018). Oberman et al. further show that incoming packets (frames) may be assigned to one of the active virtual channels by the transmitting port, or the packets may be assigned to a threshold group and have a flow number assigned to them by the Network Processor of the receiving port, depending on

the type of packet (Page 2, paragraph 0022). Also, the switch fabric may comprise a plurality of switch fabric portions 140 each having one input port and one output port and the switch fabric may include one or more input blocks 400, wherein each input block 400 is configured to receive internal format packet data (also referred to as frames) (Page 4, paragraph 0064). Further, a network switch may support K virtual channels per port, where K is a positive integer. In one embodiment, K=8. In mode 2, a port may be configured as a Gigabit Ethernet port supporting virtual channels (Page 9, paragraph 0106).

Oberman et al. further show a switch wherein control logic is configured to determine the virtual channels associated with said frames based upon virtual channel characteristics from an external device (Page 2, paragraph 0022) comprising network switches comprising a GEMAC (Gigabit Ethernet Media Access Control), which is logic (control logic) that is configurable to couple a port of the network switch to a Gigabit Ethernet. The GEMAC and port in combination may be referred to as a Gigabit Ethernet port. Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may try and establish if a corresponding port on a second network switch (transmitter) is virtual channel capable. In one embodiment, this may be performed by the management CPU of the receiver network switch by first setting up the port as a standard Gigabit Ethernet port (with or without flow control). Then, a number of virtual channel parameters (virtual channel characteristics) may be set in configuration registers, and the GEMAC (Gigabit Ethernet Media Access Control) may be enabled for the port to try and establish contact with the switch on the other end for

virtual channel-based packet flow. This is done by sending a login frame to the transmitter port. Further, when establishing virtual channels on a link between network switches, the network switches may first go through a login procedure to determine if virtual channels may be established (Page 2, paragraph 0022). Further, network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel characteristics). These calculations may be based on the information the first network switch sent out in the login message (frames) and the information the first network switch received from the second network switch (external device) in the second switch's login message. In these calculations, the network switch determines the number of virtual channels it has to support for the other switch (IgVC) and the corresponding size of the packets (frames) it will receive from the other switch for each virtual channel (IgPktSz). IgPktSz represents the generic value for the packet size for a particular virtual channel. In these calculations, the switch also determines the number of virtual channels (virtual channel characteristics) that the other switch will support for it (EgVC) and the corresponding size of the packets that it can send to the other switch (EgPktSz) (Page 16, paragraph 0193).

As to claim 20, Oberman et al. show a switch wherein said external device comprises a networking device comprising a switch (100B) (Fig. 17). Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may

try and establish if a corresponding port on a second network switch (external device) (transmitter) is virtual channel capable (Page 2, paragraph 0022).

As to claim 21, Oberman et al. show a switch wherein said external device comprises a user terminal comprising the host/server (with Fibre Channel adapter cards) in the network as well (Page 1, paragraph 0006).

As to claim 22, Oberman et al. show a switch wherein said characteristic comprises a set of virtual channel identifiers comprising network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel characteristics), thus obtaining various virtual channel identifiers along with the number of virtual channels (Fig. 25).

As to claim 23, Oberman et al. show a switch wherein said characteristics comprise a virtual channel count comprising network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel count) (Page 16, paragraph 0193).

As to claim 24, Oberman et al. show a switch wherein said characteristics comprise a virtual channel mapping mode comprising various modes including gigabit Ethernet port with virtual channel packet mode (Fig. 14).

As to claim 43, Oberman et al. show a FC fabric comprising multiple FC switches coupled together comprising Fibre Channel hubs, switches and routers coupled together in the network (Page 1, paragraph 0006), further, network switches as described herein may be incorporated into a Storage Area Network (SAN) that comprises multiple data transport mechanisms and thus supports multiple data transport protocols. These protocols may include SCSI, Fibre Channel, Ethernet and Gigabit Ethernet (Page 2, paragraph 0016). Also, Oberman et al. show a network switch that implement credit-based flow control for Gigabit Ethernet packets and SoIP packets on virtual channels over inter-switch Gigabit Ethernet links. Further, the switch (device) supporting egress (outgoing) packet flows (that is comprised of frames) (on outgoing ports/transmitting) and ingress (incoming) packet flows (on incoming ports/receiving) on one or more virtual channels of the network switch (Page 2, paragraph 0018). Oberman et al. further show that incoming packets (frames) may be assigned to one of the active virtual channels by the transmitting port, or the packets may be assigned to a threshold group and have a flow number assigned to them by the Network Processor of the receiving port, depending on the type of packet (Page 2, paragraph 0022). Also, the switch fabric may comprise a plurality of switch fabric portions 140 each having one input port and one output port and the switch fabric may include one or more input

blocks 400, wherein each input block 400 is configured to receive internal format packet data (also referred to as frames) (Page 4, paragraph 0064). Further, a network switch may support K virtual channels per port, where K is a positive integer. In one embodiment, K=8. In mode 2, a port may be configured as a Gigabit Ethernet port supporting virtual channels (Page 9, paragraph 0106).

Oberman et al. further show a switch wherein control logic is configured to determine the virtual channels associated with said frames based upon virtual channel characteristics from an external device (Page 2, paragraph 0022) comprising network switches comprising a GEMAC (Gigabit Ethernet Media Access Control), which is logic (control logic) that is configurable to couple a port of the network switch to a Gigabit Ethernet. The GEMAC and port in combination may be referred to as a Gigabit Ethernet port. Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may try and establish if a corresponding port on a second network switch (transmitter) is virtual channel capable. In one embodiment, this may be performed by the management CPU of the receiver network switch by first setting up the port as a standard Gigabit Ethernet port (with or without flow control). Then, a number of virtual channel parameters (virtual channel characteristics) may be set in configuration registers, and the GEMAC (Gigabit Ethernet Media Access Control) may be enabled for the port to try and establish contact with the switch on the other end for virtual channel-based packet flow. This is done by sending a login frame to the transmitter port. Further, when establishing virtual channels on a link between network switches, the network switches may first go through a login procedure to determine if

virtual channels may be established (Page 2, paragraph 0022). Further, network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel characteristics). These calculations may be based on the information the first network switch sent out in the login message (frames) and the information the first network switch received from the second network switch (external device) in the second switch's login message. In these calculations, the network switch determines the number of virtual channels it has to support for the other switch (IgVC) and the corresponding size of the packets (frames) it will receive from the other switch for each virtual channel (IgPktSz). IgPktSz represents the generic value for the packet size for a particular virtual channel. In these calculations, the switch also determines the number of virtual channels (virtual channel characteristics) that the other switch will support for it (EgVC) and the corresponding size of the packets that it can send to the other switch (EgPktSz) (Page 16, paragraph 0193).

As to claim 44, Oberman et al. show a switch wherein said external device comprises a networking device comprising a switch (100B) (Fig. 17). Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may try and establish if a corresponding port on a second network switch (external device) (transmitter) is virtual channel capable (Page 2, paragraph 0022).

As to claim 45, Oberman et al. show a switch wherein said external device comprises a user terminal comprising the host/server (with Fibre Channel adapter cards) in the network as well (Page 1, paragraph 0006).

As to claim 46, Oberman et al. show a switch wherein said characteristic comprises a set of virtual channel identifiers comprising network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel characteristics), thus obtaining various virtual channel identifiers along with the number of virtual channels (Fig. 25).

As to claim 47, Oberman et al. show a switch wherein said characteristics comprise a virtual channel count comprising network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel count) (Page 16, paragraph 0193).

As to claim 48, Oberman et al. show a switch wherein said characteristics comprise a virtual channel mapping mode comprising various modes including gigabit Ethernet port with virtual channel packet mode (Fig. 14).

As to claim 49, Oberman et al. show a network comprising FC fabric comprising multiple FC switches coupled together comprising Fibre Channel hubs, switches and routers coupled together in the network (Page 1, paragraph 0006; Fig. 17), further, network switches as described herein may be incorporated into a Storage Area Network (SAN) that comprises multiple data transport mechanisms and thus supports multiple data transport protocols. These protocols may include SCSI, Fibre Channel, Ethernet and Gigabit Ethernet (Page 2, paragraph 0016). Also, Oberman et al. show a network switch that implement credit-based flow control for Gigabit Ethernet packets and SoIP packets on virtual channels over inter-switch Gigabit Ethernet links. Further, the switch (device) supporting egress (outgoing) packet flows (that is comprised of frames) (on outgoing ports/transmitting) and ingress (incoming) packet flows (on incoming ports/receiving) on one or more virtual channels of the network switch (Page 2, paragraph 0018). Oberman et al. further show that incoming packets (frames) may be assigned to one of the active virtual channels by the transmitting port, or the packets may be assigned to a threshold group and have a flow number assigned to them by the Network Processor of the receiving port, depending on the type of packet (Page 2, paragraph 0022). Also, the switch fabric may comprise a plurality of switch fabric portions 140 each having one input port and one output port and the switch fabric may include one or more input blocks 400, wherein each input block 400 is configured to receive internal format packet data (also referred to as frames) (Page 4, paragraph 0064). Further, a network switch may support K virtual channels per port, where K is a

positive integer. In one embodiment, K=8. In mode 2, a port may be configured as a Gigabit Ethernet port supporting virtual channels (Page 9, paragraph 0106).

Oberman et al. further show a network of switches wherein control logic is configured to determine the virtual channels associated with said frames based upon virtual channel characteristics from an external device comprising network switches comprising a GEMAC (Gigabit Ethernet Media Access Control), which is logic (control logic) that is configurable to couple a port of the network switch to a Gigabit Ethernet. The GEMAC and port in combination may be referred to as a Gigabit Ethernet port. Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may try and establish if a corresponding port on a second network switch (transmitter) is virtual channel capable. In one embodiment, this may be performed by the management CPU of the receiver network switch by first setting up the port as a standard Gigabit Ethernet port (with or without flow control). Then, a number of virtual channel parameters (virtual channel characteristics) may be set in configuration registers, and the GEMAC (Gigabit Ethernet Media Access Control) may be enabled for the port to try and establish contact with the switch on the other end for virtual channel-based packet flow. This is done by sending a login frame to the transmitter port. Further, when establishing virtual channels on a link between network switches, the network switches may first go through a login procedure to determine if virtual channels may be established (Page 2, paragraph 0022). Further, network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels

(virtual channel characteristics). These calculations may be based on the information the first network switch sent out in the login message (frames) and the information the first network switch received from the second network switch (external device) in the second switch's login message. In these calculations, the network switch determines the number of virtual channels it has to support for the other switch (IgVC) and the corresponding size of the packets (frames) it will receive from the other switch for each virtual channel (IgPktSz). IgPktSz represents the generic value for the packet size for a particular virtual channel. In these calculations, the switch also determines the number of virtual channels (virtual channel characteristics) that the other switch will support for it (EgVC) and the corresponding size of the packets that it can send to the other switch (EgPktSz) (Page 16, paragraph 0193).

As to claim 50, Oberman et al. show a switch wherein said external device comprises a networking device comprising a switch (100B) (Fig. 17). Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may try and establish if a corresponding port on a second network switch (external device) (transmitter) is virtual channel capable (Page 2, paragraph 0022).

As to claim 51, Oberman et al. show a switch wherein said external device comprises a user terminal comprising the host/server (with Fibre Channel adapter cards) in the network as well (Page 1, paragraph 0006).

As to claim 52, Oberman et al. show a switch wherein said characteristic comprises a set of virtual channel identifiers comprising network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel characteristics), thus obtaining various virtual channel identifiers along with the number of virtual channels (Fig. 25).

As to claim 53, Oberman et al. show a switch wherein said characteristics comprise a virtual channel count comprising network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel count) (Page 16, paragraph 0193).

As to claim 54, Oberman et al. show a switch wherein said characteristics comprise a virtual channel mapping mode comprising various modes including gigabit Ethernet port with virtual channel packet mode (Fig. 14).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

> invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 6, 12, 18, 25-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oberman et al. (2003/0026267) in view of Nagami et al. (6,167,051).

As to claim 6, Oberman et al. show all the elements except a device comprising an incoming remapping table that associates internal virtual channels with virtual channels of said external device.

Nagami et al. show a device comprising an incoming remapping table that associates internal virtual channels with virtual channels of said external device comprising the managing section sets up the ATM routing table (mapping table) (that contains the incoming frames' VCIs and outgoing ports VCIs; Fig. 26a and 26b, 27a and 27b; Fig. 2) on the basis of this decision (Col. 19, lines 4-15). The managing section (control logic, 309) is part of the Cell Switched Router (CSR), which is a particular type of router that has a data link-layer switch (switch/router device; Fig. 22 and 23) to transfer packets (frames) in addition to a network-layer processing section (an ordinary router software for packet forwarding). This technology makes it possible for a router to transfer packets at a layer lower than the network layer by directly linking an input virtual connection (VC) and an output VC through the switch (Col. 2, lines 35-42; Fig. 22 and 23). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to modify the device of Oberman et al. to include a table to maintain a one-to-one correspondence of incoming and outgoing VCs to properly route/switch the incoming and outgoing frames/packets.

As to claim 12, Oberman et al. show all the elements except a device comprising an outgoing remapping table that associates internal virtual channels with virtual channels of said external device.

Nagami et al. show a device comprising an outgoing remapping table that associates internal virtual channels with virtual channels of said external device comprising the managing section sets up the ATM routing table (mapping table) (that contains the incoming frames' VCIs and outgoing ports VCIs; Fig. 26a and 26b, 27a and 27b; Fig. 2) on the basis of this decision (Col. 19, lines 4-15). The managing section (control logic, 309) is part of the Cell Switched Router (CSR), which is a particular type of router that has a data link-layer switch (switch/router device; Fig. 22 and 23) to transfer packets (frames) in addition to a network-layer processing section (an ordinary router software for packet forwarding). This technology makes it possible for a router to transfer packets at a layer lower than the network layer by directly linking an input virtual connection (VC) and an output VC through the switch (Col. 2, lines 35-42; Fig. 22 and 23). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to modify the device of Oberman et al. to include a table to maintain a one-to-one correspondence of incoming and outgoing VCs to properly route/switch the incoming and outgoing frames/packets.

As to claim 18, Oberman et al. show all the elements except a device comprising an incoming and outgoing remapping table that associates internal virtual channels with virtual channels of said external device.

Nagami et al. show a device comprising an incoming and outgoing remapping table that associates internal virtual channels with virtual channels of said external device comprising the managing section sets up the ATM routing table (mapping table) (that contains the incoming frames' VCIs and outgoing ports VCIs; Fig. 26a and 26b, 27a and 27b; Fig. 2) on the basis of this decision (Col. 19, lines 4-15). The managing section (control logic, 309) is part of the Cell Switched Router (CSR), which is a particular type of router that has a data link-layer switch (switch/router device; Fig. 22 and 23) to transfer packets (frames) in addition to a network-layer processing section (an ordinary router software for packet forwarding). This technology makes it possible for a router to transfer packets at a layer lower than the network layer by directly linking an input virtual connection (VC) and an output VC through the switch (Col. 2, lines 35-42; Fig. 22 and 23). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to modify the device of Oberman et al. to include a table to maintain a one-to-one correspondence of incoming and outgoing VCs to properly route/switch the incoming and outgoing frames/packets.

As to claim 25, Oberman et al. show a method for transmitting frames in virtual channels comprising receiving virtual channel characteristics of an external device comprising network switches (Page 2, paragraph 0022) comprising a GEMAC (Gigabit

Ethernet Media Access Control), which is logic (control logic) that is configurable to couple a port of the network switch to a Gigabit Ethernet. The GEMAC and port in combination may be referred to as a Gigabit Ethernet port. Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may try and establish if a corresponding port on a second network switch (transmitter) is virtual channel capable. In one embodiment, this may be performed by the management CPU of the receiver network switch by first setting up the port as a standard Gigabit Ethernet port (with or without flow control). Then, a number of virtual channel parameters (virtual channel characteristics) may be set in configuration registers, and the GEMAC (Gigabit Ethernet Media Access Control) may be enabled for the port to try and establish contact with the switch on the other end for virtual channel-based packet flow. This is done by sending a login frame to the transmitter port. Further, when establishing virtual channels on a link between network switches, the network switches may first go through a login procedure to determine if virtual channels may be established (Page 2, paragraph 0022). Further, network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel characteristics).

However, Oberman et al. do not specifically show a method of determining a correspondence between internal virtual channels and virtual channels of said external device and remapping outgoing frames according to said correspondence.

Nagami et al. show a method of determining a correspondence between internal virtual channels and virtual channels of said external device and remapping outgoing

frames according to said correspondence comprising the managing section (determining section) sets up the ATM routing table (mapping table) (that contains the correspondence for incoming frames' VCIs and outgoing ports VCIs; Fig. 26a and 26b, 27a and 27b; Fig. 2) on the basis of this decision (Col. 19, lines 4-15). The managing section (control logic, 309) is part of the Cell Switched Router (CSR), which is a particular type of router that has a data link-layer switch (switch/router device; Fig. 22 and 23) to transfer packets (frames) in addition to a network-layer processing section (an ordinary router software for packet forwarding). This technology makes it possible for a router to transfer packets at a layer lower than the network layer by directly linking an input virtual connection (VC) and an output VC through the switch (remapping outgoing frames to outgoing VCs) (Col. 2, lines 35-42; Fig. 22 and 23). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to modify the method of Oberman et al. to include a table to maintain a one-to-one correspondence of incoming and outgoing VCs to properly route/switch the incoming and outgoing frames/packets.

As to claim 26, Oberman et al. show a method wherein said external device comprises a networking device comprising a switch (100B) (Fig. 17). Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may try and establish if a corresponding port on a second network switch (external device) (transmitter) is virtual channel capable (Page 2, paragraph 0022).

As to claim 27, Oberman et al. show a method wherein said external device comprises a user terminal comprising the host/server (with Fibre Channel adapter cards) in the network as well (Page 1, paragraph 0006).

As to claim 28, Oberman et al. show a method wherein said characteristic comprises a set of virtual channel identifiers comprising network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel characteristics), thus obtaining various virtual channel identifiers along with the number of virtual channels (Fig. 25).

As to claim 29, Oberman et al. show a method wherein said characteristics comprise a virtual channel count comprising network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel count) (Page 16, paragraph 0193).

As to claim 30, Oberman et al. show a method wherein said characteristics comprise a virtual channel mapping mode comprising various modes including gigabit Ethernet port with virtual channel packet mode (Fig. 14).

As to claim 31, Oberman et al. show a method for receiving frames in virtual channels comprising receiving virtual channel characteristics of an external device comprising network switches (Page 2, paragraph 0022) comprising a GEMAC (Gigabit Ethernet Media Access Control), which is logic (control logic) that is configurable to couple a port of the network switch to a Gigabit Ethernet. The GEMAC and port in combination may be referred to as a Gigabit Ethernet port. Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may try and establish if a corresponding port on a second network switch (transmitter) is virtual channel capable. In one embodiment, this may be performed by the management CPU of the receiver network switch by first setting up the port as a standard Gigabit Ethernet port (with or without flow control). Then, a number of virtual channel parameters (virtual channel characteristics) may be set in configuration registers, and the GEMAC (Gigabit Ethernet Media Access Control) may be enabled for the port to try and establish contact with the switch on the other end for virtual channel-based packet flow. This is done by sending a login frame to the transmitter port. Further, when establishing virtual channels on a link between network switches, the network switches may first go through a login procedure to determine if virtual channels may be established (Page 2, paragraph 0022). Further, network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel characteristics).

However, Oberman et al. do not specifically show a method of determining a correspondence between internal virtual channels and virtual channels of said external device and remapping outgoing frames according to said correspondence.

Nagami et al. show a method of determining a correspondence between internal virtual channels and virtual channels of said external device and remapping outgoing frames according to said correspondence comprising the managing section (determining section) sets up the ATM routing table (mapping table) (that contains the correspondence for incoming frames' VCIs and outgoing ports VCIs; Fig. 26a and 26b, 27a and 27b; Fig. 2) on the basis of this decision (Col. 19, lines 4-15). The managing section (control logic, 309) is part of the Cell Switched Router (CSR), which is a particular type of router that has a data link-layer switch (switch/router device; Fig. 22 and 23) to transfer packets (frames) in addition to a network-layer processing section (an ordinary router software for packet forwarding). This technology makes it possible for a router to transfer packets at a layer lower than the network layer by directly linking an input virtual connection (VC) and an output VC through the switch (remapping outgoing frames to outgoing VCs) (Col. 2, lines 35-42; Fig. 22 and 23). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to modify the method of Oberman et al. to include a table to maintain a one-to-one correspondence of incoming and outgoing VCs to properly route/switch the incoming and outgoing frames/packets.

As to claim 32, Oberman et al. show a method wherein said external device comprises a networking device comprising a switch (100B) (Fig. 17). Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may try and establish if a corresponding port on a second network switch (external device) (transmitter) is virtual channel capable (Page 2, paragraph 0022).

As to claim 33, Oberman et al. show a method wherein said external device comprises a user terminal comprising the host/server (with Fibre Channel adapter cards) in the network as well (Page 1, paragraph 0006).

As to claim 34, Oberman et al. show a method wherein said characteristic comprises a set of virtual channel identifiers comprising network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel characteristics), thus obtaining various virtual channel identifiers along with the number of virtual channels (Fig. 25).

As to claim 35, Oberman et al. show a method wherein said characteristics comprise a virtual channel count comprising network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel count) (Page 16, paragraph 0193).

As to claim 36, Oberman et al. show a method wherein said characteristics comprise a virtual channel mapping mode comprising various modes including gigabit Ethernet port with virtual channel packet mode (Fig. 14).

As to claim 37, Oberman et al. show a method for receiving and transmitting frames in virtual channels comprising receiving virtual channel characteristics of an external device comprising network switches (Page 2, paragraph 0022) comprising a GEMAC (Gigabit Ethernet Media Access Control), which is logic (control logic) that is configurable to couple a port of the network switch to a Gigabit Ethernet. The GEMAC and port in combination may be referred to as a Gigabit Ethernet port. Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may try and establish if a corresponding port on a second network switch (transmitter) is virtual channel capable. In one embodiment, this may be performed by the management CPU of the receiver network switch by first setting up the port as a standard Gigabit Ethernet port (with or without flow control). Then, a number of virtual channel parameters (virtual channel characteristics) may be set in configuration registers, and the GEMAC (Gigabit Ethernet Media Access Control) may be enabled for the port to try and establish contact with the switch on the other end for virtual channel-based packet flow. This is done by sending a login frame to the transmitter port. Further, when establishing virtual channels on a link between network switches, the network switches may first go through a login procedure to determine if virtual channels may be

established (Page 2, paragraph 0022). Further, network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel characteristics).

However, Oberman et al. do not specifically show a method of determining a correspondence between internal virtual channels and virtual channels of said external device and remapping outgoing frames according to said correspondence.

Nagami et al. show a method of determining a correspondence between internal virtual channels and virtual channels of said external device and remapping outgoing frames according to said correspondence comprising the managing section (determining section) sets up the ATM routing table (mapping table) (that contains the correspondence for incoming frames' VCIs and outgoing ports VCIs; Fig. 26a and 26b, 27a and 27b; Fig. 2) on the basis of this decision (Col. 19, lines 4-15). The managing section (control logic, 309) is part of the Cell Switched Router (CSR), which is a particular type of router that has a data link-layer switch (switch/router device; Fig. 22 and 23) to transfer packets (frames) in addition to a network-layer processing section (an ordinary router software for packet forwarding). This technology makes it possible for a router to transfer packets at a layer lower than the network layer by directly linking an input virtual connection (VC) and an output VC through the switch (remapping outgoing frames to outgoing VCs) (Col. 2, lines 35-42; Fig. 22 and 23). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to modify the method of Oberman et al. to include a table to maintain a one-to-one

correspondence of incoming and outgoing VCs to properly route/switch the incoming and outgoing frames/packets.

As to claim 38, Oberman et al. show a method wherein said external device comprises a networking device comprising a switch (100B) (Fig. 17). Further, on power-up of the network switch, a Gigabit Ethernet port of a first network switch (receiver) may try and establish if a corresponding port on a second network switch (external device) (transmitter) is virtual channel capable (Page 2, paragraph 0022).

As to claim 39, Oberman et al. show a method wherein said external device comprises a user terminal comprising the host/server (with Fibre Channel adapter cards) in the network as well (Page 1, paragraph 0006).

As to claim 40, Oberman et al. show a method wherein said characteristic comprises a set of virtual channel identifiers comprising network switches on a particular link that may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel characteristics), thus obtaining various virtual channel identifiers along with the number of virtual channels (Fig. 25).

As to claim 41, Oberman et al. show a method wherein said characteristics comprise a virtual channel count comprising network switches on a particular link that

may calculate the egress and ingress packet sizes for each of the virtual channels, and the number of egress and ingress virtual channels (virtual channel count) (Page 16, paragraph 0193).

As to claim 42, Oberman et al. show a method wherein said characteristics comprise a virtual channel mapping mode comprising various modes including gigabit Ethernet port with virtual channel packet mode (Fig. 14).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Any inquiry concerning this communication or earlier communications from the examiner should be directed to VAIBHAV (MANU) SAWHNEY whose telephone number is 571-272-9738. The examiner can normally be reached on Monday - Friday 07:30AM - 1700 EST, alt. fri. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, KWANG B. YAO can be reached on 571-272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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